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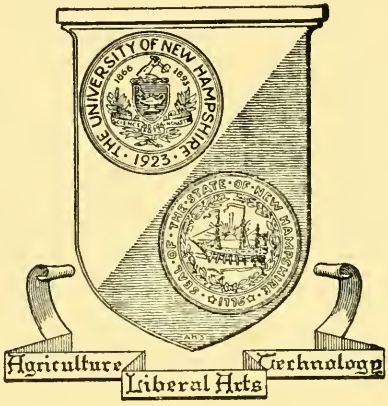

The University
of
New Hampshire

BULLETIN 371 AUGUST, 1947

THE UNIVERSITY OF NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION
Department of Agricultural and Biological Chemistry

Inspection of Commercial Fertilizers

Made for the
STATE DEPARTMENT OF AGRICULTURE

T. O. SMITH and H. A. DAVIS

THE UNIVERSITY OF NEW HAMPSHIRE
DURHAM, N. H.

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the

State Department of Agriculture

The inspection of commercial fertilizers reported in this bulletin was made under the direction of the Honorable R. W. Smith, Acting Commissioner of Agriculture. Mr. George H. Laramie, Fertilizer Control Supervisor, and Mr. Vincent P. Peterson, Inspector, collected samples of 70 brands of fertilizer and fertilizer materials which were offered for sale by dealers or had been delivered to consumers during the year ending June, 1947. The general character of the brands sampled is shown by the following classification:

Complete fertilizer	45
Phosphoric acid and potash	6
Superphosphate	5
Nitrate of soda	1
Ammonium nitrate (Nitraprills)	1
Muriate of potash	3
Ground bone	2
Milorganite	1
Natural manures	6

THE FERTILIZER LAW

The purchaser of fertilizer should familiarize himself with the full text of the fertilizer law. He should not accept from the dealer any bag of fertilizer which is not tagged and guaranteed in compliance with the law. The law governing these matters is as follows:

"Every lot or parcel of commercial fertilizer or fertilizer material sold or offered or exposed for sale within this state shall be accompanied by a plainly printed statement, clearly and truly certifying the number of net pounds of fertilizer in the package; the name,, brand or trademark under which the fertilizer is sold; the name and address of the manufacturer or importer; the location of the factory; and a chemical analysis stating the minimum percentage of nitrogen, of available phosphoric acid and of water-soluble potash expressed in whole numbers.

"No fertilizer or fertilizer material containing the three essential fertilizing elements, nitrogen, phosphoric acid and potash may be sold or offered for sale if the total minimum plant food nutrients contained therein is less than fourteen per cent by weight, provided however that natural animal and bird manures shall be excepted from the provisions of this section."

Copies of the full text of the law may be obtained from the Fertilizer Control Supervisor, State House, Concord, N. H. Inquiries concerning the law and all matters relative to the registration of brands should be addressed to his office.

The chief purpose of the official inspection required by the fertilizer law is to protect the consumer against the misbranded products which doubtless would soon appear on the market if the sale of fertilizer was not under state regulation. The value of a fertilizer depends mainly upon its content of available plant food, particularly nitrogen, phosphoric acid, and potash. The presence of these constituents can be determined only by a chemical analysis. To insure

that they are being furnished by manufacturers in the guaranteed amounts, it is considered necessary that each brand of fertilizer offered for sale be officially inspected and analyzed one or more times each year. When failure to meet the guarantee is proved by chemical analysis, the prosecution or seizure provisions of the law may be invoked. The purchaser's refusal to buy a fertilizer which does not conform to the law will not only assist in the enforcement of the law but will at the same time insure himself the protection of the law. If the buyer fails to assure himself that the legal requirements have been met, he accepts the fertilizer at his own risk.

USE OF COMMERCIAL FERTILIZERS

This bulletin is concerned with the enforcement of the fertilizer law. It is not within its scope to make recommendations regarding the use of commercial fertilizers. The Department of Agronomy and the Department of Agricultural and Biological Chemistry of the University of New Hampshire Agricultural Experiment Station test soils and conduct experimental work with various fertilizer materials on hay and crop land. The Department of Horticulture investigates fertilizer treatments for fruits and vegetables. Much of this work has been published, and is available for free distribution to residents of New Hampshire. Address your request to Mail Service, University of New Hampshire, Durham, New Hampshire.

Sta. Cir.	47	Fertilizer Experiments with Sweet Clover. 12 pp.
Sta. Cir.	50	Fertilizer Experiments with Hay Lands in the Connecticut Valley. 15 pp.
Sta. Cir.	58	Fertilizer Needs of Alfalfa on New Hampshire Soils. 12 pp.
Sta. Cir.	59	Effect of Soil Moisture and Fertilizer Placement on Vitality of the Potato Seed Piece. 11 pp.
Sta. Cir.	61	Fertility Needs of Dairy Farm Crops in the Connecticut Valley. 12 pp.
Sta. Cir.	63	Fertilizers for Sweet Corn. 8 pp.
Sta. Cir.	374	The Response of Clover and Total Forage to Top-Dressing Fertilizers.
Sta. Bull.	306	Experiments with Grass Hay. 24 pp.
Sta. Bull.	320	Pasture Top-Dressing in New Hampshire. 24 pp.
Sta. Bull.	324	Experiment with Potatoes. 38 pp.
Sta. Bull.	362	Purchasing Fertilizers in New Hampshire. 31 pp.
Ext. Cir.	65	Worn-Out Hay Lands. 4 pp.
Ext. Cir.	99	Asparagus Culture. 4 pp.
Ext. Cir.	104	Blackberries for New Hampshire. 4 pp.
Ext. Cir.	147	Top-Dressing Hay Lands. 4 pp.
Ext. Cir.	173	Grape Growing in New Hampshire. 11 pp.
Ext. Cir.	210	Purchasing Lime and Fertilizer. 12 pp.
Ext. Cir.	211	Strawberry Culture. 4 pp.
Ext. Cir.	212	Cabbage. 4 pp.
Ext. Cir.	220	Tomatoes for Good Health. 8 pp.
Ext. Cir.	264	Red Raspberry Culture. 4 pp.
Ext. Cir.	266	Root Crops. 20 pp.
Ext. Cir.	273	The Home Vegetable Garden. 20 pp.
Ext. Bull.	45	Potato Growing in New Hampshire. 32 pp.
Ext. Bull.	59	The Apple Orchard in New Hampshire. 39 pp.
Ext. Bull.	65	Home Fruit Growing in New Hampshire. 16 pp.

While the word fertilizer does not appear in all the above titles, no publication is included which does not discuss the use of fertilizer.

CONFORMITY TO GUARANTEE

The chemical analyses were made by the methods of the Association of Official Agricultural Chemists. Forty-five of the 70 brands analyzed equaled or exceeded the manufacturer's guarantee. One brand failed to meet the guarantee in all of the three constituents, total nitrogen, available phosphoric acid, and water-soluble potash. Nine brands were below guarantee in two of the three constituents. Fifteen brands failed to meet the guarantee in only one constituent. Six brands were guaranteed to contain magnesium oxide. None failed to meet the guarantee.

In the tabulation of the analyses in the following pages deficiencies of one-fourth of one per cent or more are shown in red bold-face type. The manufacturers are arranged alphabetically. The brand name is listed alphabetically, or numerically by formula, under the manufacturer.

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
American Agricultural Chemical Co. North Weymouth, Mass.										
Agrico 0-14-14	....	....	....	12.66	14.00	12.32	14.00	7.80	....	....
Agrico Bone Meal	2.00	2.64	25.00	26.22	....	16.42	....	....	....	....
Agrico Country Club Fertilizer	8.00	8.01	....	7.09	6.00	6.75	2.00	2.48	....	....
Agrico for Corn 3-12-6	3.00	2.95	....	13.26	12.00	11.27	6.00	6.09	....	....
Agrico for Corn 4-12-4	4.00	4.04	....	12.76	12.00	12.06	4.00	4.02	....	....
Agrico for Gardens 5-10-5	5.00	5.06	....	10.50	10.00	10.00	5.00	5.10	....	....
Agrico for Lawn, Trees and Shrubs	6.00	5.92	....	10.74	10.00	10.36	4.00	3.80	....	....
Agrico for New England	5.00	4.81	....	8.89	8.00	8.03	7.00	7.15	....	....
Agrico for Potatoes	5.00	5.03	....	10.44	10.00	10.08	10.00	10.08	....	....
Agrico for Seeding Down	3.00	3.02	....	13.17	12.00	12.75	12.00	10.17	....	....
Agrico for Top Dressing	7.00	6.80	....	7.86	7.00	7.45	7.00	6.19	....	....
18% Normal Superphosphate	....	....	....	19.04	18.00	18.06	....	....	....	....
Pulverized Sheep Manure	1.25	1.76	1.00	1.52	....	1.21	2.00	2.01	....	....
Apothecaries Hall Co. Waterbury, Conn.										
Liberty Brand 5-10-5	5.00	5.17	....	10.90	10.00	10.50	5.00	5.15	....	....
Liberty High Grade Market Garden	5.00	5.37	....	8.68	8.00	8.34	7.00	8.38	....	....
Liberty Brand High Grade Vegetable 5-10-10	5.00	5.13	....	10.52	10.00	10.15	10.00	10.24	....	....
Armour Fertilizer Works New York, N. Y.										
Armour's 4-12-4	4.00	4.24	....	12.44	12.00	12.01	4.00	4.29	....	....
Armour's 5-10-5	5.00	4.86	....	10.66	10.00	10.06	5.00	5.01	....	....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Armour's 5-10-10	5.00	5.09	....	10.98	10.00	10.26	10.00	9.71	....	....
Armour's Big Crop Fertilizer 0-14-7	....	....	....	15.22	14.00	14.21	7.00	7.58	....	....
Armour's Big Crop Fertilizer 4-12-8	4.00	4.05	....	12.91	12.00	12.29	8.00	8.38	....	....
Armour's Big Crop Fertilizer 7-7-7	7.00	6.89	....	7.80	7.00	7.38	7.00	6.67	....	....
Armour's Sheep Manure	1.50	1.51	....	1.27	1.00	1.07	1.50	1.64	....	....
Armour's Superphosphate 20%	....	....	....	20.90	20.00	20.17	....	....	....	....
Berkshire Chemical Co. Bridgeport, Conn.										
Berkshire Fertilizer 0-14-14	....	....	....	13.86	14.00	13.64	14.00	13.34	....	....
Berkshire Fertilizer 5-8-7	5.00	5.02	....	8.43	8.00	8.24	7.00	7.16	....	....
Berkshire Fertilizer 5-10-10	5.00	5.03	....	10.59	10.00	10.41	10.00	10.02	....	....
Berkshire Fertilizer 7-7-7	7.00	7.08	....	7.37	7.00	7.17	7.00	7.15	....	....
Chilean Nitrate Sales Corp. New York, N. Y.										
Chilean Nitrate of Soda	16.00	16.18	....	....	....	....	....	....	....	....
Consolidated Rendering Co. Boston, Mass.										
Corenco 0-14-14	....	....	....	14.31	14.00	14.07	14.00	14.65	....	....
Corenco 4-12-4	4.00	4.39	....	12.32	12.00	11.57	4.00	5.01	....	....
Corenco 5-10-10	5.00	5.11	....	11.75	10.00	10.01	10.00	10.43	....	....
Corenco Ground Bone	2.00	2.24	23.00	25.70	....	16.60	....	....	....	....
Corenco Landscape Fertilizer	8.00	7.67	....	7.27	6.00	6.31	4.00	4.01	....	....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Corenco Potato and General Crop	5.00	5.05		8.24	8.00	8.02	7.00	7.13		
Corenco Sheep Manure	1.25	2.06		1.43	1.00	1.27	2.00	2.95		
Superphosphate 20%				20.42	20.00	20.06				
Eastern States Farmers' Exchange West Springfield, Mass.										
Eastern States 5-10-5	5.00	5.40		10.60	10.00	10.36	5.00	5.70	2.00	3.08
Eastern States 5-10-10	5.00	5.27		10.46	10.00	10.16	10.00	10.86	1.00	2.50
Eastern States 5-15-10-1	5.00	5.31		14.77	15.00	14.35	10.00	11.10	1.00	2.25
Eastern States 8-16-16	8.00	7.63		19.17	16.00	18.91	16.00	15.07		
Eastern States 8-24-8	8.00	8.14		24.77	24.00	24.35	8.00	8.24		
Eastern States Muriate of Potash							60.00	60.29		
Eastern States 20% Superphosphate				21.30	20.00	20.32				
International Minerals and Chemical Corp. Woburn, Mass.										
5-10-10-2 for Potatoes	5.00	5.10		10.76	10.00	10.06	10.00	10.01	2.00	2.53
International 0-14-14				14.50	14.00	14.20	14.00	15.43		
International 5-8-7	5.00	4.85		8.69	8.00	8.09	7.00	7.19		
International 5-10-10	5.00	5.16		10.48	10.00	9.52	10.00	10.26		
International 7-7-7	7.00	6.83		7.80	7.00	7.21	7.00	7.13		
International 8-6-2	8.00	7.80		6.84	6.00	6.06	2.00	2.68		
International 8-16-16-1½	8.00	7.78		16.36	16.00	16.12	16.00	15.66	1.50	1.88
International Caribee 5-10-10-2	5.00	5.15		10.44	10.00	10.10	10.00	10.07	2.00	2.21
International 60% Muriate of Potash							60.00	60.78		
International Sheep Manure	1.25	1.59	1.00	1.22		1.08	2.00	3.39		
International 20% Superphosphate				20.70	20.00	19.61				

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Merrimack Farmers' Exchange Concord, N. H.										
Merrimack 0-14-14	....	....		14.33	14.00	13.64	14.00	14.28		
Merrimack Brand 4-12-4	4.00	4.19		12.80	12.00	12.04	4.00	4.46		
Merrimack Brand 5-8-7	5.00	5.04		8.88	8.00	8.26	7.00	7.56		
Merrimack Brand 5-10-10	5.00	5.12		11.16	10.00	10.42	10.00	10.28		
Norwood Brand Fertilizer Co. North Reading, Mass.										
Norwood Brand Sheep Manure	1.83	1.31		0.24	0.89	0.18	1.03	2.57		
Potash Company of America Carlsbad, New Mexico										
Muriate of Potash							60.00	60.72		
Profile Fertilizer Co. Manchester, N. H.										
Sheep Fertilizer	1.53	1.30	0.26	0.16	0.20	0.10	3.00	2.22		
Rogers & Hubbard Co. Portland, Conn.										
Hubbard High Potash Fertilizer	5.00	5.36		10.46	10.00	10.10	10.00	10.21		
Hubbard Potato Fertilizer	5.00	5.25		8.73	8.00	8.51	7.00	7.39		
Red H Fertilizer 4-12-4	4.00	4.71		11.92	12.00	11.23	4.00	4.60		
Red H 5-8-7	5.00	5.22		8.47	8.00	8.17	7.00	7.58		

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Sewerage Commission Milwaukee, Wis.										
Milorganite	6.00	6.01	....	2.68	2.00	2.28	....	....	....	....
Swift & Co. Baltimore, Md.										
Vigoro	4.00	4.03	....	12.86	12.00	12.14	4.00	4.12	....	....
Welland Chemical Work, Ltd. Niagara Falls, Ontario										
Nitraprills (Ammonium Nitrate)	33.50	33.60	....	....	....	....	....	....	....	....